HORIBA Techno Service Introduce "Analytical Solution Plaza" HORIBA's Services that Connect "Analysis" and "Understanding (Finding out)"

SAKAGUCHI Mai

HORIBA Techno Service Analytical Solutions Plaza has areas for each of HORIBA's focus markets such as "Energy & Environment", "Advanced Materials & Semiconductors", and "Biotechnology & Healthcare". As a center connecting 18 application laboratories in Japan and overseas, HORIBA's core analytical technologies are concentrated here.
HORIBA promotes application proposals, contract analysis, and joint development tailored to customer needs. As a solution partner to our customers, we aim to provide high value-added services.

Analytical Solution Plaza Newly Established

HORIBA Techno Service, a group company of HORIBA, Ltd., takes charge of service business such as maintenance and inspection of HORIBA products. In recent years, in order to provide customers with even better solutions, we have been expanding our business from "selling products" to "selling services," including product maintenance, contract analysis, user training, calibration, instrument testing and analyzer subscriptions.

In February 2021, as a project to commemorate the 20th anniversary of the establishment of HORIBA Techno Service, the Kyoto Head Office Building, the core base of our business, was constructed on a site adjacent to HORIBA, Ltd. Concurrently, we opened analytical application laboratories on the first and second floors and named it the "Analytical Solution Plaza.

Measurement and analysis technologies are indispensable for the advancement of science and technology and the development of industry, and HORIBA wanted to have a place not only to disseminate technical information on analytical instruments, but also to listen to the opinions of customers in various fields and have interactive exchanges with them. With this in mind, the Analytical Solution Plaza aims to be a "place where HORIBA and our customers can interact" where people can gather freely, transcending the boundaries of technical fields. The laboratory area has been expanded to twice the size of the previous facility and analytical instruments has been set up in areas which HORIBA focuses on that are "Energy & Environment," "Materials & Semiconductors," and "Bio and Healthcare,". The Analytical Solution Plaza is now a hub connecting 18 analytical application laboratories in Japan and overseas, where core analytical technologies are concentrated.

Figure 1 HORIBA Techno Service head office building.

The logo (Figure 2) expresses its desire to be a place where various people and technologies are interwoven and to always transmit information to the world with a sense of speed. We aim to provide high value-added services as a solution partner to our customers.

Analytical Solution Plaza

Figure 2 Analytical Solution Plaza logo.

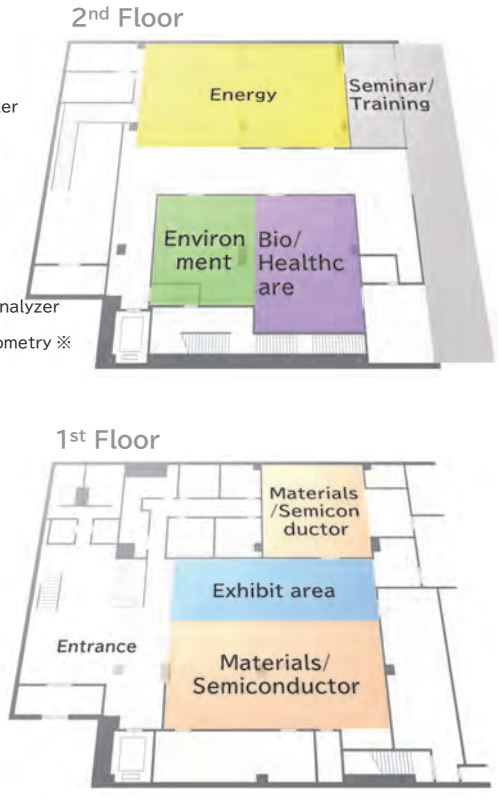
Figure 3 Analytical Solution Plaza floor.

Energy

- Carbon/Sulfur Analyzer
- Oxygen/Nitrogen/Hydrogen Analyzer
- Laser Scattering Particle Size Distribution Analyzer
- Nanoparticle Analyzer
- Centrifugal Nanoparticle Analyzer
- ICP Emission Spectrometer
- X-ray Fluorescence Sulfur-in-Oil Analyzer
- Gas Chromatography Mass Spectrometry ※
- Ion Chromatography※

Environment

- pH/water Quality Analyzer
- Oil Content Analyzer
- On-line TOC Analyzer
- Automatic Total Nitrogen/Phosphorus Monitoring
- Automatic COD Monitor
- Continuous Particulate Monitor with X-ray Fluorescence
- Portable Gas Analyzer



Bio/Healthcare

- Transmission Raman Spectrometer
- LC-Raman System
- Rapid Microorganism Detection System
- Molecular Interaction Analyzer (SPR)
- Fluorescence and Absorbance Spectrometer

Materials and Semiconductors

- Laser Scattering Particle Size Distribution Analyzer
- Nanoparticle Analyzer
- X-ray Analytical Microscope (Micro-XRF)
- Fluorescence Spectrometer/Time Resolved Fluorescence Spectrometer
- Spectroscopic Ellipsometry
- Atomic Force Microscope Raman Spectrometer
- Confocal Raman Microscope
- Glow Discharge Optical Emission Spectrometry
- Scanning Electron Microscope※
- Field Emission-Scanning Electron Microscope※

※ Other companies' products

Figure 4 Analytical Solution Plaza equipment layout.

Figure 5 HORIBA Group analytical application labs: 18 locations in Japan and overseas.

Functions of Analytical Solution Plaza

Contract Analysis

In addition to HORIBA products, the Analytical Solution Plaza is equipped with a variety of equipment such as sample preparation equipment, glove boxes and other sealed containers for samples that cannot be handled in the atmosphere and electron microscopes so that various analysis methods can be proposed. We can also modify our instruments and develop sample pretreatment equipment to meet your analytical needs.

Analytical instrument use service

We offer a new paid service for the use of analytical instruments at Analytical Solution Plaza (Kyoto and Tokyo), which can be used on a half-day or full-day basis. An analyst is present so that you can use the instruments while discussing directly with the analyst how to use them, the optimal measurement conditions and analysis methods. We also offer a subscription service in which you can rent analyzers for a fixed monthly fee.

User Training

The seminar room on the second floor is fully equipped with online studio facilities and other equipment, making it possible to conduct on-site analysis and online training from remote locations using remote functions. We also have training plans that utilize 3D data from MR (Mixed Reality) devices, and can respond to requests from both domestic and overseas customers.

Calibration Service

We calibrate equipment such as digital multimeters and balances 8nd issue traceability certificates. We also inspect PEMS (Portable Emission Gas Analyzer: device

Figure 6 Analysis scene.

Figure 7 Analytical instrument service.

Figure 8 Training.

name OBS) and gas dividers (GDC) used in road tests. As calibration services, we provide on-site JAB-accredited calibration services for MRA (Mutual Recognition Across the World) in the field of chassis dynamometers and emission gas measurement systems used in the automotive industry. Our accredited calibration certificates with the ILAC-MRA combined symbol are compliant with IATF 16949:2016, and our ISO/IEC 17025-compliant calibration certificates with the ILAC MRA accreditation symbol are also compliant with IATF 16949 requirements for automotive quality management systems.

Figure 9 Calibration service.

Automotive Contract Testing

HORIBA offers various vehicle tests such as engine evaluation, catalyst test, fuel consumption test, etc., by combining measuring instruments including engine exhaust gas measurement systems, which are HORIBA's main products.

Our engineers with experience in engine development and vehicle inspection provide total support from bench testing to actual road testing. In recent years, we have also conducted tests on batteries and fuel cells installed in automobiles. In addition to power consumption tests and charge-discharge tests on battery modules and cells, we can also provide a full range of services from module processing and cell disassembly to evaluation of each material to enable various tests.

Figure 10 Automotive testing.

Application Topics

Analysis of cultural assets

I Kenji Miyazawa's Drafts: Cooperating to Determine Authenticity

We cooperated in analyzing the authenticity of a draft poem said to have been written by Kenji Miyazawa in the early Showa period.

This draft was investigated by Hanamaki City in Iwate Prefecture to determine if it could be an autograph, as it differed from previous drafts in that the red and black text were reversed and the signature of "Kenji" was missing. HORIBA Techno Service conducted elemental analysis of two drafts which were written around the same time, using a micro X-ray analyzer (XGT-9000). The determination of the type of elements contained in a material is one indicator of the type of ink, paper, and other materials used. Based on the results of this analysis and the results of previous research on Kenji Miyazawa, Hanamaki City announced that "this draft is an autograph draft of Miyazawa Kenji".

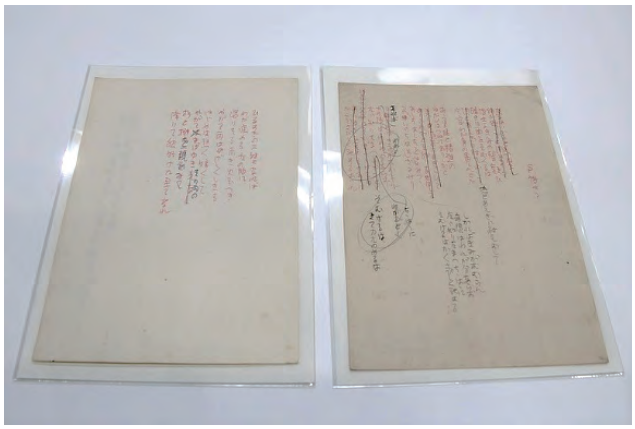


Figure 11 Draft of Kenji Miyazawa.

Figure 12 X-ray microanalyzer (XGT-9000).

II Cooperation in Research of Vincent van Gogh's Painting

Vincent van Gogh's works have been the subject of various studies around the world and as part of a survey of Van Gogh's paintings in the collection of the Pola Museum of Art in Hakone, we analyzed the composition of the paints used in the works.

Non-destructive and non-contact analysis methods are required for the analysis of art works such as paintings and photographs. In addition, it is difficult to take artworks out of the museum due to the security and storage environment, and rapid analysis is required. In order to meet these requirements, we modified the equipment so that it could analyze the paintings appropriately and installed it in the museum's basement storage room for analysis. Based on the elements detected, we were able to estimate the type of paint that Van Gogh is believed to have used.

We will continue to contribute to the elucidation and preservation of cultural assets such as documents and paintings by measuring and analyzing their production dates and materials.

Figure 13 X-ray analyzer for large samples (XGT).

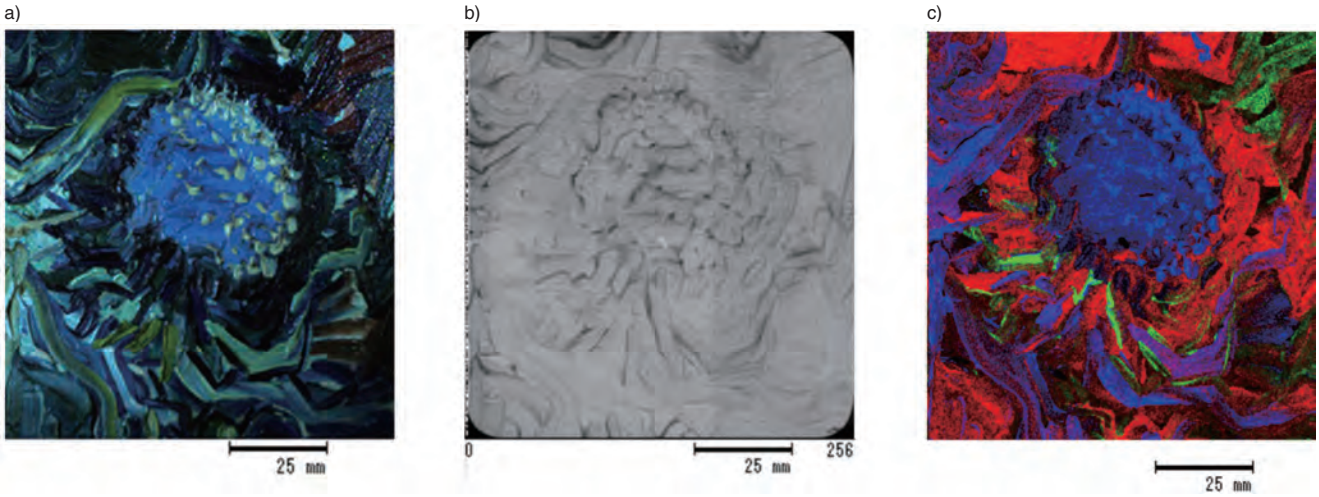


Figure 14 Mapping image (thistle flower; Vincent van Gogh)
a) optical microscope image, b) X-ray transmission image, c) multilayer image (red: copper, green: iron, blue: zinc).

JAXA Participates in the Initial Analysis Project of Hayabusa2

The asteroid Ryugu is thought to be a celestial body with information about the birth of the solar system approximately 4.6 billion years ago. The Japan Aerospace Exploration Agency (JAXA)'s "Hayabusa2" successfully completed its mission to bring back samples from Ryugu, and in June 2021, scientists from 14 countries around the world began the initial analysis. The initial analysis was conducted by six international teams (chemical analysis team, stone material analysis team, sand material analysis team, volatile components analysis team, solid organic material analysis team, and soluble organic material analysis team) over a period of about one year. HORIBA Techno Service belonged to the chemical analysis team and conducted analyses using a micro X-ray fluorescence spectrometer, a Raman microscope, and a carbon-sulfur analyzer to elucidate the chemical properties of the Ryugyu samples, including what elements were contained in what proportions and in what state of bonding.

In the initial analysis, it was necessary not only to perform the analysis with high precision, but also to minimize contamination of the sample for the next analysis team. Therefore, based on our accumulated analytical know-how, we developed a special container called a "cell" that is strong, sealed, and easy to handle. Using the developed cell, we were able to maintain optimum conditions for analysis and conduct nondestructive, non-contact analysis. Further investigations will be conducted by other teams to understand the nature and origin of Ryugu, and to unravel the mysteries of the origin and evolution of the solar system and life.

Figure 15 Measurement with Raman spectrometer.

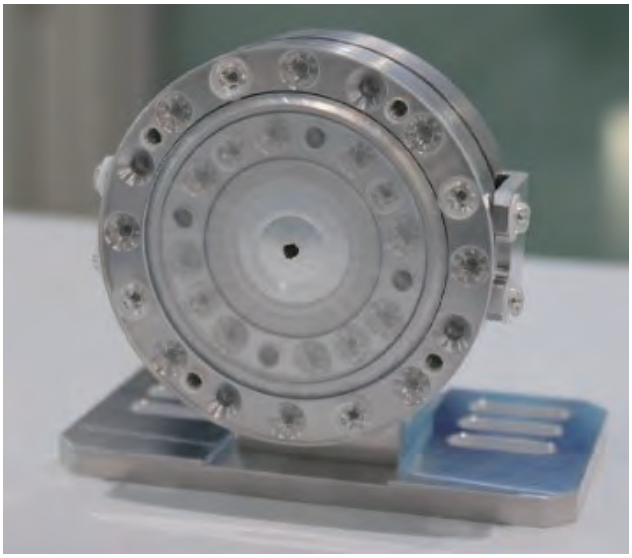


Figure 16 Cell for measurement.

Conclusion

The above is an explanation of the newly established Analytical Solution Plaza and examples of solutions using HORIBA's analyzers. HORIBA Techno Service will continue to make every effort to help our customers realize their "understanding" by providing solutions through "measurement.

* Editorial note: This content in based on HORIBA's investigation at the year of issue unless otherwise stated.

SAKAGUCHI Mai
Analytical & Testing Technology Department
Analytical Technology Division
HORIBA Techno Service Co., Ltd.